

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Improvements in Means for Providing Drag in Aircraft

We, KAISER CARGO, INC., a corporation organized and existing under the laws of the State of California, United States of America, of Bristol, Bucks County, State of Pennsylvania, United States of America, (Assignees of THOMAS KNOX and WILLIAM IRVING STIEGLITZ, both citizens of the United States of America, respectively of Bristol and Morrisville, Bucks County, State of Pennsylvania, United States of America), do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to aircraft and particularly to auxiliary flaps adapted to be adjusted in flight to afford additional drag, and thereby to decrease the speed of the aircraft in a dive or to permit rapid deceleration in level flight.

An object of the invention is to provide an arrangement by which when the auxiliary flaps are in operative position eddy currents are minimized by interruption of the surface thereof while when the auxiliary flaps are in closed position a continuous surface is presented.

The invention will be better understood by reference to the following specification and accompanying drawings in which

Figure 1 is a transverse section through a wing and flap with the auxiliary flaps mounted thereon;

Figure 2 is an enlarged sectional view illustrating one of the auxiliary flaps in relation to the main flap;

Figure 3 is an enlarged plan view of a section of the main flap and one of the auxiliary flaps; and

Figure 4 is a diagrammatic sectional view illustrating the operating means for the auxiliary flaps.

In describing the invention the auxiliary flaps are considered as accessories to landing flaps which are pivotally secured to the wings of the plane. Referring to the drawing, 5 indicates a wing of any suitable construction having a landing flap 6 pivotally connected at the trailing edge thereof. The details of the landing flap and its connection with the wing structure form no part of the present invention, such

structures being common in the art.

The landing flap is provided with recesses 7 on the opposite faces thereof, and the auxiliary flaps 8 are pivoted at 9 and normally rest in the recesses so as to afford a streamlined outer surface on the landing flap. The auxiliary flaps 8 are designed to be moved to the position indicated in full lines in Figure 1 by the operator of the aircraft when it is necessary or desirable to retard the speed of the aircraft.

In accordance with the present invention, in order to avoid the production of undesirable eddy currents, the auxiliary flaps 8 are provided with a plurality of relatively large openings 10, distributed over the entire surface of each of the auxiliary flaps. Such openings would normally interrupt the surface when the auxiliary flaps are in closed position, that is to say disposed in the recesses in the landing flap. To avoid this difficulty, the surface of the landing flap is provided with a plurality of bosses 11 arranged to register with the openings 10 when the auxiliary flaps are in closed position. This affords a smooth streamlined surface, avoiding the introduction of undesirable drag when the auxiliary flaps are not in use.

To permit the performance of the desired function, the auxiliary flaps 8 are moved simultaneously to operative position in angular relation to the landing flap. This control may be effected in any practicable manner. One practicable adaptation of mechanism permitting simultaneous operation of the flaps is indicated diagrammatically in Figure 4 in which the auxiliary flaps 8, pivoted at 9 in the structure of the landing flap 6, are provided with arms 12 inwardly directed and connected by links 13 to a piston rod 14 carrying a piston 15 in a cylinder 16. Fluid under pressure may be supplied under control of a suitable valve (not shown) to the cylinder 16 through inlets 17 on opposite sides of the piston 15 to actuate the latter in either direction. Such movement will actuate the auxiliary flaps 8 to the open or closed position as may be desired, and hold them rigidly in the selected position. No attempt is made

herein to illustrate or describe the details of the hydraulic actuating mechanism which is commonly employed for similar purposes in the art.

- 5 The apparatus as described affords a simple and effective means for accomplishing the desired purpose. When the aircraft is flying under normal conditions, the auxiliary flaps will be closed and
10 ineffective. When braking effect is required, the operator may, by a simple movement, adjust the auxiliary flaps to their operative position at which they become effective for the purpose of the
15 invention. No further attention is required, as the auxiliary flaps perform their function without adjustment. It is, of course, essential that the auxiliary flaps be operated in pairs in order to afford the
20 necessary balance and thus avoid diverting the plane from its intended path under control of the operator.

Having now particularly described and ascertained the nature of our said inven-

tion and in what manner the same is to be performed, we declare that what we claim is:— 25

In aircraft, a movable landing flap having recesses on each side thereof, auxiliary flaps pivotally connected to the landing flap and resting in the recesses, the auxiliary flaps each having a plurality of openings therein, and bosses on the landing flap registering with the openings to afford substantially smooth surfaces when the auxiliary flaps are disposed in the recesses, and means for moving the auxiliary flaps simultaneously from the recesses to positions projecting angularly with relation to the landing flap. 30 35 40

Dated this 11th day of June, 1943.
CRUIKSHANK & FAIRWEATHER,
29 Southampton Buildings,
Chancery Lane, London, W.C.2,
and
29 St. Vincent Place, Glasgow,
Agents for the Applicants.

[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1,

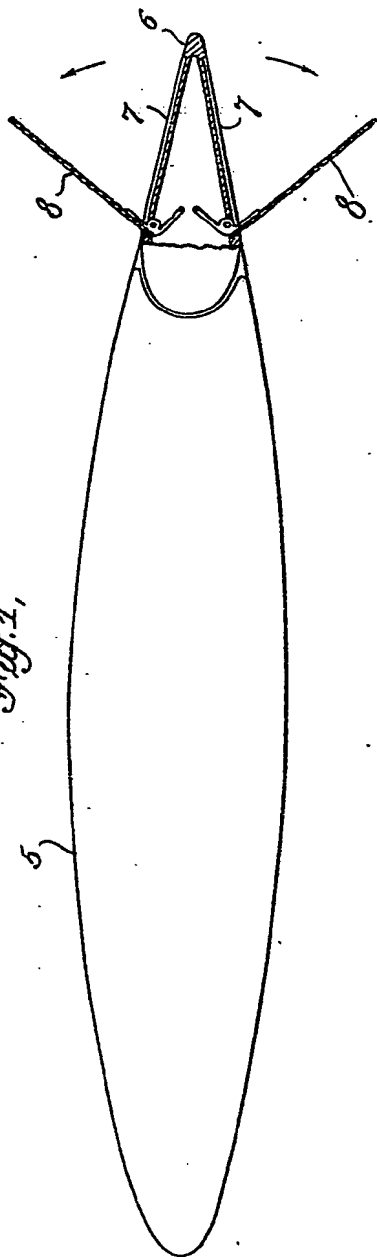
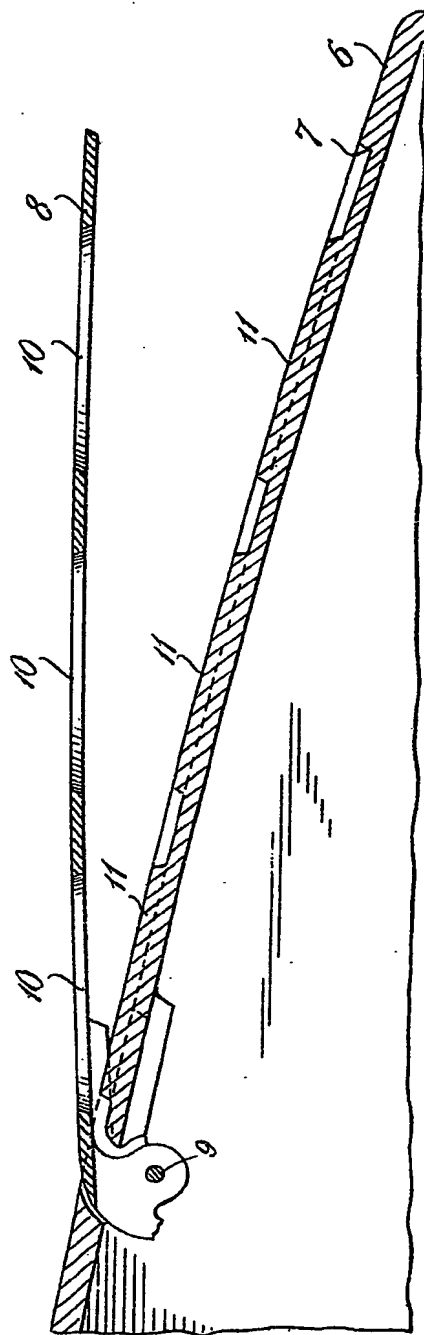


Fig. 2,



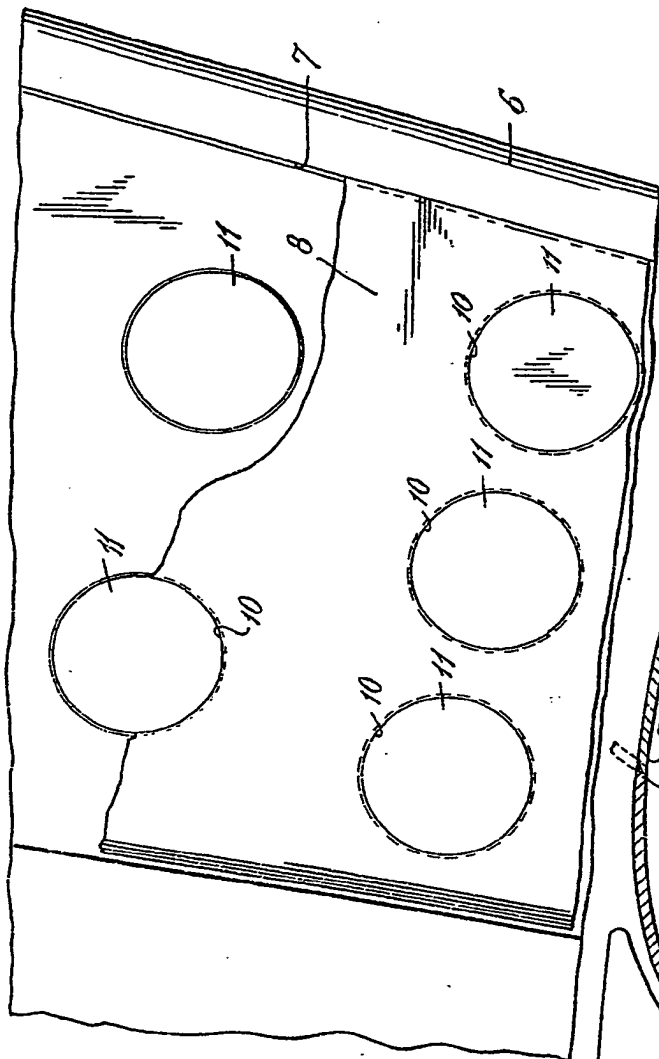


Fig. 3,

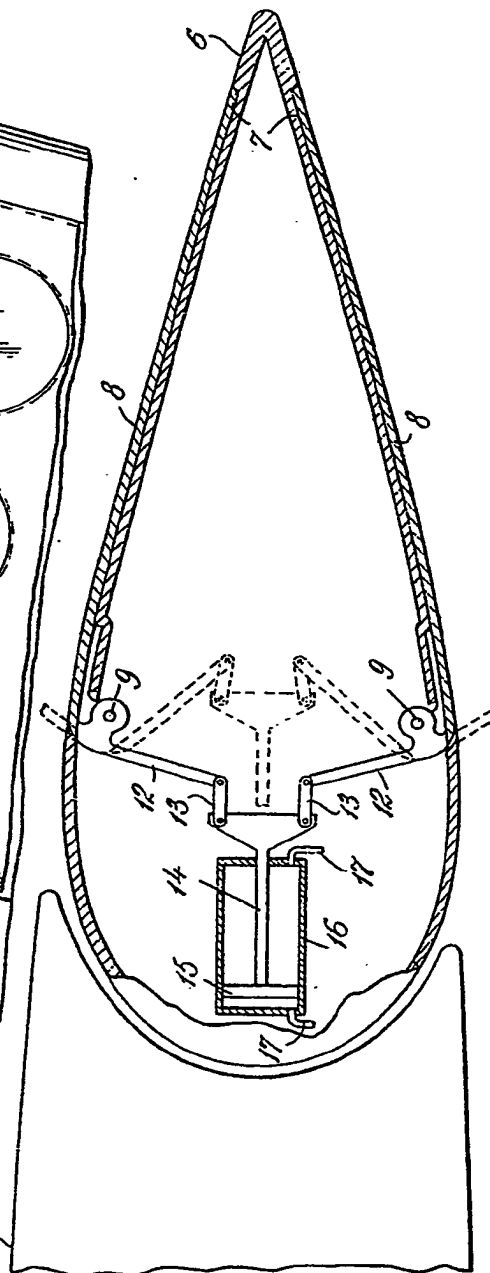
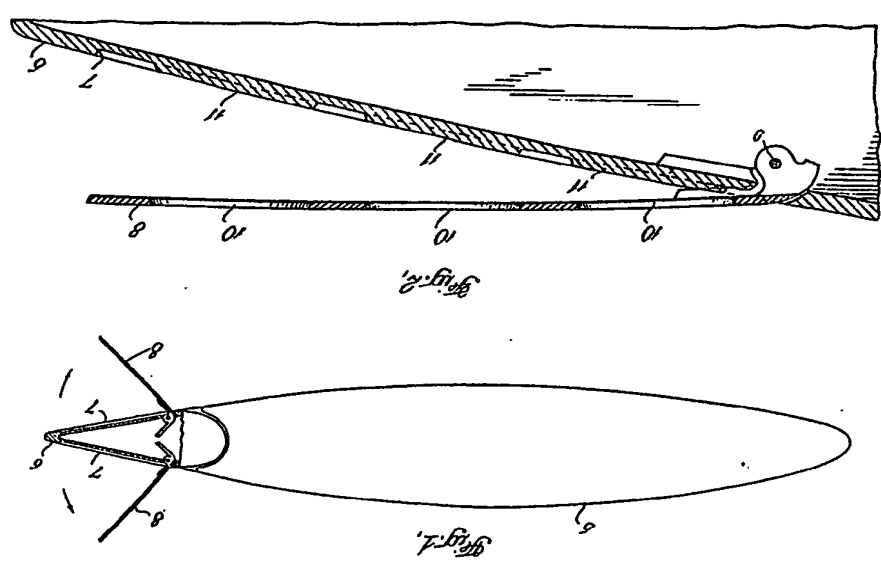
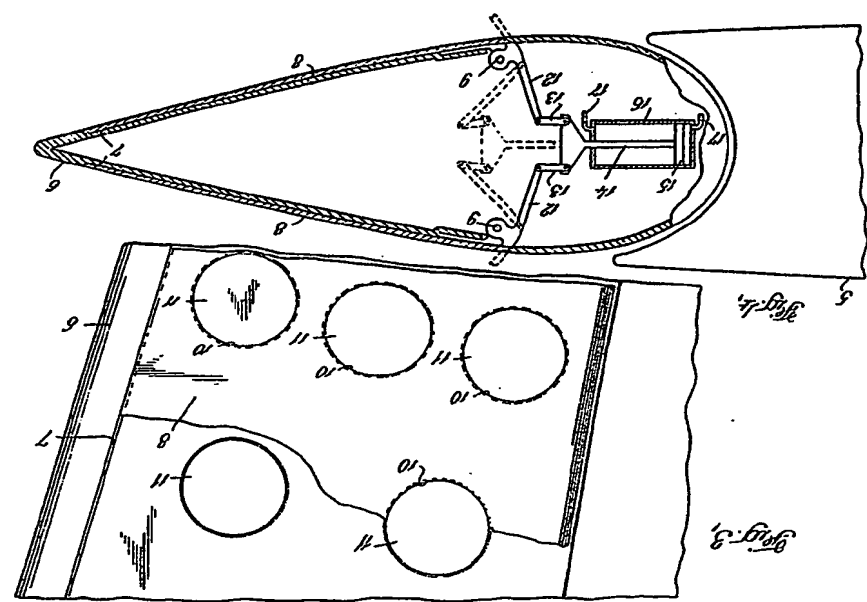


Fig. 4,

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